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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/892,918	Applicant(s) KAJIYA ET AL.	
	Examiner Nathan Curs	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4, 5, 8, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. (US Patent No. 6362913) in view of applicant's admission of prior art (figs. 12-15 and page 2, line 23 to page 9, line 15).

Regarding claim 1, Ooi et al. disclose an optical transmission apparatus for transmitting an optical pulse string having a frequency two times that of a driving signal, said optical transmission apparatus comprising: a Mach-Zehnder optical modulator (fig. 34, element 2); a light source which inputs an optical signal into said optical modulator (fig. 34, element 1); a driving unit which inputs the driving signal into the optical modulator (fig. 34, element 4); a converting unit which receives a frequency component of the driving signal, takes out a part of an optical signal output from said optical modulator and converts that part of the optical signal into electric signal (fig. 34, elements 7 and 8); an error signal generating unit which includes a level detector for detecting a level of the frequency component of the driving signal and a processing unit for generating an error signal based on the level detected by the level detector, the error signal generating unit generating the error signal of a bias voltage for minimizing a value of a frequency component of the driving signal extracted by said extracting unit (fig. 34, elements 9, 10 and 11, where the amplifier grouped with the phase comparator makes a level detector because amplifying the extracted component to the proper level before comparing the

phase of two signals involves detecting the extracted component level and amplifying it to the proper level for phase comparison, and where the LPF is a processing unit because it rectifies the output of the phase comparator to provide the error signal to the bias supply unit); and a bias voltage control unit which applies a bias voltage to said optical modulator (fig. 34, element 12) (col. 3, line 5 to col. 4, line 2). In the figure 34 embodiment, Ooi et al. do not disclose an extracting unit connected to the converting unit which extracts a frequency component of the driving signal included in the electric signal converted by said converting unit; however this feature is disclosed in another embodiment (fig. 7, elements 57a and 57b and col. 14, line 64-67). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the bandpass filter of the figure 7 embodiment in the figure 34 embodiment as well, to raise the precision of the phase comparator, as taught by Ooi et al. Also, Ooi et al. disclose applying a bias voltage to the optical modulator, where the bias supply circuit inputs the error signal of the bias voltage, and that the error signal is at zero when the bias is proper, since the error signal is based on the detection of the fo frequency component and where the bias voltage applied to the modulator is controlled in dependence on the direction of drift of the operating point of the modulator, said drift represented by the error signal of the bias voltage (fig. 34, and col. 3, line 63 to col. 4, line 2), but do not explicitly disclose a bias voltage added with the error signal of the bias voltage and then applied to the optical modulator. The applicant's admitted prior art discloses a DC bias voltage added with an error signal of the bias voltage to create a controlled bias signal then applied to an optical modulator (specification fig. 12, element 110 and page 2, line 23 to page 9, line 15). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the output of a DC voltage source to the error signal inputted to the Bias Supply Circuit of Ooi et al., to provide the advantage of a baseline bias voltage level in the event that the error signal is at a very small level or zero (i.e. when the

modulator is properly biased). In the case of a very small or zero error signal level, the modulator would become unstable and inoperable if the bias voltage consisted of only the error signal. This would contradict the disclosure that the bias is proper when the error signal is at zero. Without a controlled voltage source added with the error signal voltage, the modulator would not be able to operate when the error signal was zero.

Regarding claim 4, the combination of Ooi et al. and applicant's admitted prior art disclose the optical transmission apparatus according to claim 1, further comprising a dither signal generating unit which generates a dither signal that is input into the error signal generating unit (Ooi et al.: fig. 34, element 5 and fig. 25, elements 54 and 73), wherein said error signal generating unit carries out a synchronous detection by comparing a dither signal to a frequency component of a driving signal or a frequency component two times that of the driving signal extracted by said extracting unit, and outputs a result of this synchronous detection to the bias voltage control unit as an error signal of the bias voltage, and said bias voltage control unit applies to said optical modulator a signal obtained by super imposing the error signal of the bias voltage with the bias voltage (as described above for claim 1). Ooi et al. disclose outputting a phase difference between the dither frequency signal and the extracted frequency component (Ooi et al.: col. 3, lines 21-26 and col. 22, lines 24-36), but do not disclose multiplying the dither signal with the frequency component of the driving signal. However, Ooi et al. also disclose extracting and isolating the frequency component of the driving signal in the transmission signal using a bandpass filter (Ooi et al.: col. 14, lines 64-67) and therefore it would have been obvious to one of ordinary skill in the art at the time of the invention that the phase difference could be achieved by multiplying the dither frequency signal by the isolated frequency component of the extracted signal to get a phase difference result. Also, Ooi et al. disclose superimposing the dither signal onto the driving signal, and disclose the driving signal

and the bias voltage applied to the same modulator electrode, but do not disclose inputting the dither signal to the bias voltage control unit. However, it would have been obvious to one of ordinary skill in the art at the time of the invention that the dither signal could be applied to either the driving signal or the bias voltage of Ooi et al., in order to superimpose the bias signal on the transmission signal during the modulation of Ooi et al, since both the driving signal and bias voltage are applied to the same modulator electrode.

Regarding claim 5, Ooi et al. disclose an optical transmission apparatus for transmitting an optical pulse string having a frequency two times that of a driving signal, said optical transmission apparatus comprising: a Mach-Zehnder optical modulator (fig. 25, element 52); a light source which inputs an optical signal into said optical modulator (fig. 25, element 51); a driving unit which inputs the driving signal into said optical modulator (fig. 25, element 53); a converting unit which receives a frequency component of the driving signal, takes out a part of an optical signal output from said optical modulator and converts that part of the optical signal into electric signal (fig. 25, elements 56 and 57a); an extracting unit connected to the converting unit, the extracting unit extracting a frequency component two times that of the driving signal included in the electric signal converted by said converting unit (fig. 25, element 2fo and col. 22, lines 24-36 and the band-pass filter teaching of col. 14, lines 64-67 directly applicable to the embodiment of fig. 25); an error signal generating unit which includes a level detector for detecting a level of the frequency component of the driving signal and a processing unit for generating an error signal based on the level detected by the level detector, the error signal generating unit generating the error signal of a bias voltage for maximizing a value of the frequency component two times that of the driving signal extracted by said extracting unit (fig. 25, elements 57b, 57c and 57d, and col. 22, lines 24-36, where the amplifier grouped with the phase comparator makes a level detector because amplifying the extracted component to the

proper level before comparing the phase of two signals involves detecting the extracted component level and amplifying it to the proper level for phase comparison, and where the LPF is a processing unit because it rectifies the output of the phase comparator to provide the error signal to the bias supply unit). Ooi et al. disclose applying a bias voltage to the optical modulator, where the bias supply circuit inputs the error signal of the bias voltage, and that the error signal is at a maximum when the bias is proper, since the error signal is based on the detection of the 2fo frequency component (fig. 25, element 58 and col. 22, lines 18-49), and where the bias voltage applied to the modulator is controlled in dependence on the direction of drift of the operating point of the modulator, said drift represented by the error signal of the bias voltage (fig. 7 and col. 15, lines 1-16, which also applies to the fig. 25 embodiment as disclosed by Ooi et al.), but do not explicitly disclose a bias voltage added with the error signal of the bias voltage and then applied to the optical modulator. The applicant's admitted prior art discloses a DC bias voltage added with an error signal of the bias voltage to create a controlled bias signal then applied to an optical modulator (specification fig. 12, element 110 and page 2, line 23 to page 9, line 15). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the output of a DC voltage source to the error signal inputted to the Bias Supply Circuit of Ooi et al., to provide the advantage of a baseline bias voltage level in the event that the error signal is at a very small level (i.e. if the modulator were to become improperly biased). In the case of a very small error signal level, the modulator would become unstable and inoperable if the bias voltage consisted of only the error signal. Without a controlled voltage source added with the error signal voltage, the modulator would not be able to recover when the error signal was low.

Regarding claim 8, the combination of Ooi et al. and applicant's admitted prior art discloses the optical transmission method according to claim 5, further comprising a dither

signal generating unit which generates a dither signal that is input into the error signal generating unit (Ooi et al.: fig. 34, element 5 and fig. 25, elements 54 and 73), wherein said error signal generating unit carries out a synchronous detection by comparing a dither signal to a frequency component of a driving signal or a frequency component two times that of the driving signal extracted by said extracting unit, and outputs a result of this synchronous detection to the bias voltage control unit as an error signal of the bias voltage, and said bias voltage control unit applies to said optical modulator a signal obtained by super imposing the error signal of the bias voltage with the bias voltage (Ooi et al.: col. 3, line 5 to col. 4, line 2). The combination discloses outputting a phase difference between the dither frequency signal and the extracted frequency component (Ooi et al.: col. 3, lines 21-26 and col. 22, lines 24-36), but does not disclose multiplying the dither signal with the frequency component of the driving signal. However, the combination also discloses extracting and isolating the frequency component of the driving signal in the transmission signal using a bandpass filter (Ooi et al.: col. 14, lines 64-67) and therefore it would have been obvious to one of ordinary skill in the art at the time of the invention that the phase difference could be achieved by multiplying the dither frequency signal by the isolated frequency component of the extracted signal to get a phase difference result. Also, the combination discloses superimposing the dither signal onto the driving signal, and discloses the driving signal and the bias voltage applied to the same modulator electrode, but does not disclose input the dither signal to the bias voltage control unit. However, it would have been obvious to one of ordinary skill in the art at the time of the invention that the dither signal could be applied to either the driving signal or the bias voltage, in order to superimpose the bias signal on the transmission signal during the modulation, since both the driving signal and bias voltage are applied to the same modulator electrode.

Regarding claim 9, Ooi et al. disclose a bias voltage control method for an optical modulator to be used for an optical transmission apparatus that inputs an optical signal into a Mach-Zehnder optical modulator (fig. 34, element 2), applies a driving signal and a bias voltage to said optical modulator (fig. 34, elements 4 and 12), and transmits an optical pulse string having a frequency two times that of the driving signal (col. 3, lines 42-52), the method comprising the steps of: receiving a frequency component of the driving signal and taking out a part of an optical signal output from said optical modulator and converting that part of the optical signal into electric signal (fig. 34, elements 7 and 8); detecting a level of the frequency component of the driving signal (fig. 34, elements 9 and 10, where the amplifier grouped with the phase comparator detects a level of the frequency component because amplifying the extracted component to the proper level before comparing the phase of two signals involves detecting the extracted component level and amplifying it to the proper level for phase comparison); generating an error signal of a bias voltage based on the level detected for minimizing a value of the frequency component of the driving signal (fig. 34, elements 10 and 11); and applying a bias voltage to said optical modulator (fig. 34, element 12) (col. 3, line 5 to col. 4, line 2). In the figure 34 embodiment, Ooi et al. do not disclose an extracting unit connected to the converting unit which extracts a frequency component of the driving signal; however this feature is disclosed in another embodiment (fig. 7, elements 57a and 57b and col. 14, line 64-67). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the bandpass filter of the figure 7 embodiment in the figure 34 embodiment as well, to raise the precision of the phase comparator, as taught by Ooi et al. Also, Ooi et al. disclose applying a bias voltage to the optical modulator, where the bias supply circuit inputs the error signal of the bias voltage, and that the error signal is at zero when the bias is proper, since the error signal is based on the detection of the fo frequency component and where the bias

voltage applied to the modulator is controlled in dependence on the direction of drift of the operating point of the modulator, said drift represented by the error signal of the bias voltage (fig. 34, and col. 3, line 63 to col. 4, line 2), but do not explicitly disclose a bias voltage added with the error signal of the bias voltage and then applied to the optical modulator. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the applicant's prior art voltage source teaching with Ooi et al. as described above for claim 1.

Regarding claim 10, Ooi et al. disclose a bias voltage control method for an optical modulator to be used for an optical transmission apparatus that inputs an optical signal into a Mach-Zehnder optical modulator (fig. 25, element 52), applies a driving signal and a bias voltage to said optical modulator (fig. 25, elements 53 and 58), and transmits an optical pulse string having a frequency two times that of the driving signal (col. 22, lines 24-36), the method comprising the steps of: receiving a frequency component of the driving signal and taking out a part of an optical signal output from said optical modulator and converting that part of the optical signal into electric signal (fig. 25, elements 56 and 57a); extracting a frequency component two times that of the driving signal from the obtained electric signal (fig. 25, element 2fo and col. 22, lines 24-36 and the band-pass filter teaching of col. 14, lines 64-67 directly applicable to the embodiment of fig. 25); detecting a level of the frequency component of the driving signal (fig. 34, elements 9 and 10, where the amplifier grouped with the phase comparator detects a level of the frequency component because amplifying the extracted component to the proper level before comparing the phase of two signals involves detecting the extracted component level and amplifying it to the proper level for phase comparison); generating an error signal of a bias voltage based on the detected level for maximizing a value of the frequency component two times that of the driving signal (fig. 25, element 57d, and col. 22, lines 24-36, where the LPF is a processing unit because it rectifies the output of the phase comparator to provide the error

signal to the bias supply unit). Ooi et al. disclose applying a bias voltage to the optical modulator, where the bias supply circuit inputs the error signal of the bias voltage, and that the error signal is at a maximum when the bias is proper, since the error signal is based on the detection of the 2fo frequency component (fig. 25, element 58 and col. 22, lines 18-49), and where the bias voltage applied to the modulator is controlled in dependence on the direction of drift of the operating point of the modulator, said drift represented by the error signal of the bias voltage (fig. 7 and col. 15, lines 1-16, which also applies to the fig. 25 embodiment as disclosed by Ooi et al.), but do not explicitly disclose a bias voltage added with the error signal of the bias voltage and then applied to the optical modulator. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the applicant's prior art voltage source teaching with Ooi et al. as described above for claim 5.

3. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. (US Patent No. 6362913) in view of applicant's admission of prior art (figs. 12-15 and page 2, line 23 to page 9, line 15), as applied to claims 1, 4, 5, 8, 9 and 10 above, and further in view of Miyamoto et al. (US Patent No. 6559996).

Regarding claims 2 and 6, the combination of Ooi et al. and applicant's admitted prior art discloses the optical transmission apparatus and method according to claims 1 and 5 respectively, but does not disclose that said light source generates a modulated optical pulse synchronous with the driving signal and having a bit rate two times that of the driving signal, and supplies the optical pulse to said optical modulator, and said optical modulator pulse modulates the optical pulse with the driving signal and outputs the modulated optical pulse. Miyamoto et al. disclose an optical source modulated by a clock signal synchronized with a transmission rate, and then modulated by a data signal, the double modulation producing an RZ signal (fig.

26 and col. 13, line 63 to col. 14, line 16). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a modulated source signal prior to the existing modulator in the system of Ooi et al., in order to be able to produce an RZ transmission signal, for better transmission performance and longer transmission distance, as taught by Miyamoto et al. (col. 1, lines 30-51).

4. Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. (US Patent No. 6362913) in view of applicant's admission of prior art (figs. 12-15 and page 2, line 23 to page 9, line 15), as applied to claims 1, 4, 5, 8, 9 and 10 above, and further in view of Jabr (US Patent No. 6229632).

Regarding claims 3 and 7, the combination of Ooi et al. and applicant's admitted prior art discloses the optical transmission apparatus and method according to claims 1 and 5 respectively, but does not disclose that said light source includes a plurality of single-wavelength light sources each of which emits light having different single-wavelength, said optical transmission apparatus further comprising an optical filter, provided at the front stage of said converting unit, which transmits light having only a desired wavelength out of the lights having different wavelength emitted by said single-wavelength light sources that constitute an optical signal output from said optical modulator. Jabr disclose an optical modulator based transmitter for improving signal to noise ratio that uses a plurality of single-wavelength light sources having different wavelengths, modulating the wavelengths with a MZ modulator, followed by filtering and recombination of the wavelengths (fig. 2 and col. 2, line 43 to col. 3, line 15). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the plural wavelength source transmission method of Jabr with the stabilized bias voltage modulator of Ooi et al. to improve the signal to noise ratio of the transmission of the Ooi

et al. system, as taught by Jabr. In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention, in order to properly maintain the bias stabilization function of Ooi et al. when combining with the teaching of Jabr, to add a single wavelength filter at the front of the converting unit of Ooi et al., to filter out one wavelength of the plural wavelength transmission, either to extract the low frequency component if one only source wavelength were to carry the component, or to extract the component from only one wavelength if both wavelengths were to carry the component to avoid any phase cancellation of the component that could occur from extracting the same component from both wavelengths without filtering.

5. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. (US Patent No. 6362913) in view of applicant's admission of prior art (figs. 12-15 and page 2, line 23 to page 9, line 15), and further in view of Ishihara (US Patent No. 5557648).

Regarding claim 11, Ooi et al. disclose a method of making an optical transmission apparatus, comprising: providing an optical modulator to output an optical signal (fig. 25, element 52); providing a first signal generator to generate a driving signal for said optical modulator, said driving signal including a frequency component (fig. 25, element 53); and providing a second signal generator to generate an error signal, the second signal generator including a level detector for detecting a level of the frequency component and a processor for generating an error signal based on the level detected by the level detector, said error signal generated from the frequency component, indicating a change in a bias voltage to be input to said optical modulator (fig. 25, elements 57a, 57b, 57c and 57d and col. 14, lines 61-67 and col. 22, lines 24-36, where the amplifier grouped with the phase comparator makes a level detector because amplifying the extracted component to the proper level before comparing the phase of two signals involves detecting the extracted component level and amplifying it to the proper

level for phase comparison, and where the LPF is a processor because it rectifies the output of the phase comparator to provide the error signal to the bias supply unit); providing a controller to generate the bias voltage, and where said bias voltage and said driving signal are input to drive the optical modulator (fig. 25, elements 55 and 58). Ooi et al. disclose applying a bias voltage to the optical modulator, where the bias supply circuit inputs the error signal of the bias voltage, and that the error signal is at a maximum when the bias is proper, since the error signal is based on the detection of the 2fo frequency component (fig. 25, element 58 and col. 22, lines 18-49), and where the bias voltage applied to the modulator is controlled in dependence on the direction of drift of the operating point of the modulator, said drift represented by the error signal of the bias voltage (fig. 7 and col. 15, lines 1-16, which also applies to the fig. 25 embodiment as disclosed by Ooi et al.), but do not explicitly disclose a predetermined bias voltage combined with the error signal of the bias voltage and then applied to the optical modulator. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the applicant's prior art voltage source teaching with Ooi et al. as described above for claim 5. Also, Ooi et al. disclose that said error signal is generated in a feedback loop and is generated from the frequency component, but do not disclose that it is generated from the frequency component satisfying a predetermined threshold to generate a digital detection signal which is converted to an analog signal. Ishihara discloses a control circuit including a determining circuit that DC averaging circuit for an alternating signal input and has a digitizing converter receiving a the DC signal and converting the DC signal from an analog signal to a digital signal (fig. 23 and col. 15, lines 38-59), using quantizing thresholds. It would have been obvious to an artisan at the time of the invention to use the teaching of the control circuit of Ishihara et al. for the error signal generating circuit of Ooi et al., to provide the benefit of digital precision, based on the quantizing thresholds, in defining the level of an error signal. Further, it would have been obvious to one of

ordinary skill in the art at the time of the invention to use a digital-to-analog converter, which are well known in the art, at the output of the error signal generating circuit, before combining the error signal with the analog bias signal circuit for the modulator, so that the analog signal levels are compatible.

Regarding claim 12, the combination Ooi et al., applicant's admitted prior art and Ishihara disclose the method of claim 11, wherein said providing includes providing the optical modulator to output an optical signal with a frequency two times greater than value of frequency component of the driving signal (Ooi et al.: fig. 25, element 2fo and col. 22, lines 24-36).

Regarding claim 13, the combination Ooi et al., applicant's admitted prior art and Ishihara disclose the method of claim 11, but do not disclose minimizing the detected frequency component for the fig. 25 apparatus of Ooi et al. However, Ooi et al. disclose that providing the second signal generator to generate an error signal to minimize the value of the detected frequency component of the driving signal is conventional (fig. 34 and col. 3, lines 5-41). It would have been obvious to one of ordinary skill in the art at the time of the invention to minimize the detected frequency component in controlling the bias voltage of the modulator, as this approach using phase comparison of the detected frequency component and the generated frequency component is conventional, as taught by Ooi et al.

Regarding claim 14, the combination Ooi et al., applicant's admitted prior art and Ishihara disclose the method of claim 11, wherein said providing includes providing the second signal generator to generate an error signal to maximize value of two times frequency component of the driving signal (fig. 25 and col. 22, lines 24-36).

Response to Arguments

6. Applicant's arguments from page 13 and 14 of the amendment filed 10 June 2005 have been fully considered but they are not persuasive.

The applicant argues that the previous office action recognized that Ooi, Miyamoto, Jabr and Ishihara do not teach the features of generating an error signal and adding the bias voltage and the error signal to create the final bias voltage supplied to the modulator. This is a partially incorrect understanding of the previous office action. The previous office action recognized that Ooi does not explicitly teach the feature of adding the bias voltage and the error signal to create the final bias voltage supplied to the modulator, but was combined with the teaching of the AAPA to read on the claimed feature. Ooi already taught generating an error signal as previously cited.

The applicant also argues that Ooi does not teach an extracting unit; however the applicant admits that Ooi teaches a band pass filter to pass the frequency component. This band pass filter filters, or extracts, the frequency component. Therefore, the bandpass filter is an extracting unit. Further, the applicant argues that Ooi doesn't teach detecting a level of the frequency component; however, the amplifier grouped with the phase comparator makes a level detector because amplifying the extracted component to the proper level before comparing the phase of two signals involves detecting the extracted component level and amplifying it to the proper level for phase comparison. The applicant also argues that Ooi doesn't teach generating an error signal; however, the LPF generates an error signal because it rectifies the output of the phase comparator to provide a signal to the bias supply unit indicating the error of the bias voltage.

7. Applicant's arguments from page 15, line 1 to page 17, line 11 of the amendment filed 10 June 2005 have been fully considered but they are not persuasive. These arguments do not

meet the requirements of Rule 37 CFR 1.111, which requires that applicant distinctly and specifically point out errors in the examiner's action. Arguments or conclusions of counsel cannot take the place of evidence.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

9. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of

a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600